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IN THE CLAIMS:

**1. (Currently Amended)** A method executed in hardware for simulating events in a physical system comprising the steps of:

~~assigning events of said physical system that are to be simulated to each of N processing elements (PEs); and~~

a) employing hardware that comprises N processing elements (PEs) that can communicate with each other;

b) subdividing said physical system into N subsystems and assigning a different subsystem of said subsystems to each of said N PEs;

c) in a simulation step, each of said PEs concurrently simulating a respective block of events that occur in each respectively assigned subsystem, where said block includes said N PEs simulating events in parallel, in a simulation step where each processing element (PE) simulates assigned events in blocks of that include M edge events, where M is approximately  $e \log_e N$ , e is approximately 2.71828, and an edge event is an event whose simulation in a processing element is directly affected by information originating in another processing element;

repeating step c) a chosen number of times; and

outputting results of said simulations from each of said N PEs.

**2. (Currently Amended)** The method of claim 1 where ~~each of~~ said simulation step[[s]] comprises one or more iterations.

**3. (Currently Amended)** The method of claim 2 where ~~each of~~ said iterations comprises a simulation phase followed by a communication phase and an assessment phase.

**4. (Original)** The method of claim 3 where, in each communication phase, each of said PEs shares information with one or more other PEs from said N PEs, which information is needed by said other PEs to simulate edge events of said other PEs.

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**5. (Original)** The method of claim 4 where said information shared by each PE in a communication phase of an iteration is related to events simulated by said each PE in said iteration.

**6. (Original)** The method of claim 4 where said assessment phase carried out by each of said PEs comprises the steps of determining whether the existence of a simulation error can be excluded, and directing that another simulation iteration is to take place when the existence of a simulation error cannot be excluded.

**7. (Previously Presented)** The method of claim 6 further comprising a floor advancement step that is carried out in each of said PEs when said step of determining in said assessment phase concludes that there are no simulation errors in a simulation iteration, where the advancement step advances a simulation floor time of a present simulation step to form a modified simulation time floor, for simulating another block of M events in a next simulation step.

**8. (Original)** The method of claim 6 further comprising a step of advancing a simulation floor time from a simulation floor time of a present simulation step, to form a modified simulation floor time, for starting from said modified simulation floor time the simulation of another block of M events in a next simulation step, when said step of determining in said assessment phase concludes that there are no simulation errors in said present simulation step.

**9. (Original)** The method of claim 8 where said modified simulation floor time corresponds to the earliest simulation time of the M<sup>th</sup> edge event simulated by said N PEs in said present simulation step.

**10. (Original)** The method of claim 4 where events are simulated seriatim in each simulation phase.

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**11. (Original)** The method of claim 10 where for simulating a second event following a simulation of a first event,

a time interval is identified between a simulation time of said first event and a simulation time of said second event, and  
said second event is identified for simulation.

**12. (Original)** The method of claim 11 where said second event is identified for simulation following a step of accounting for simulation of said first event and simulation of events in said other PEs from said N PEs.

**13. (Original)** The method of claim 12 where said accounting is based on present knowledge of states of said other events.

**14. (Currently Amended)** The method of claim 12 where said ~~accounts~~  
accounting for simulation of events in said other PEs from said N PEs accounts for events simulated during said time interval.

**15. (Original)** The method of claim 11 where said second event is identified by employing a first random number.

**16. (Original)** The method of claim 11 where said time interval is identified with a second random number.

**17. (Original)** The method of claim 16 where said second random number is set to said first random number.

**18. (Original)** The method of claim 15 where said first random number is derived from a random variable having a uniform distribution.

**19. (Original)** The method of claim 15 where the seriatim simulation of each event in said block of M events, in a first iteration starting from a given simulation floor

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time, employs an independently derived random number from said random variable, forming thereby a sequence of random numbers, and simulation of said block of M events in all subsequent iterations starting from said given simulation floor time employs said sequence of random numbers.

**20. (Original)** The method of claim 18 where the sequence of random numbers employed in one simulation step is different from a sequence of random numbers employed in another simulation step.

**21. (New)** Apparatus that includes N interacting processing elements (PEs), the improvement characterized by:

each of said N PEs storing a specification of a subsystem of a system composed of interacting subsystems; and

said N PEs (a) executing a selected number of simulation steps, and in each simulation step each of said PE's simulates a block of operational events of its associated subsystem, where a block contains M edge events, where M is approximately equal to  $\log N$ , and an edge event is an event whose simulation in a processing element is directly affected by information originating in another processing element, and (b) outputting results of the simulations.

**22. (New)** A storage element comprising:

a first module that, when executed in a processor, simulates operational events of a stored subsystem that is part of a system of interacting subsystems, primarily in blocks that contain M edge events, in addition to non-edge events, where M is approximately equal to  $\log N$ , and an edge event is an event whose simulation in a processing element is directly affected by information originating from simulations by another module that is substantially the same as said first module, which other module is executed in another processor; and

a second module that outputs simulated operational events resulting from execution of said first module.

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**5. (Original)** The method of claim 4 where said information shared by each PE in a communication phase of an iteration is related to events simulated by said each PE in said iteration.

**6. (Original)** The method of claim 4 where said assessment phase carried out by each of said PEs comprises the steps of determining whether the existence of a simulation error can be excluded, and directing that another simulation iteration is to take place when the existence of a simulation error cannot be excluded.

**7. (Previously Presented)** The method of claim 6 further comprising a floor advancement step that is carried out in each of said PEs when said step of determining in said assessment phase concludes that there are no simulation errors in a simulation iteration, where the advancement step advances a simulation floor time of a present simulation step to form a modified simulation time floor, for simulating another block of M events in a next simulation step.

**8. (Original)** The method of claim 6 further comprising a step of advancing a simulation floor time from a simulation floor time of a present simulation step, to form a modified simulation floor time, for starting from said modified simulation floor time the simulation of another block of M events in a next simulation step, when said step of determining in said assessment phase concludes that there are no simulation errors in said present simulation step.

**9. (Original)** The method of claim 8 where said modified simulation floor time corresponds to the earliest simulation time of the M<sup>th</sup> edge event simulated by said N PEs in said present simulation step.

**10. (Original)** The method of claim 4 where events are simulated seriatim in each simulation phase.

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**23. (New)** The storage element of claim **22** further comprising a third module that communicates with said other module.

**24. (New)** The storage element of claim **23** further comprising a fourth module that assesses whether, based on information received by said third module, any of said M edge events need to be re-simulated.